set in from the N. at Manchioneal, Port Antonio, Port Maria, Falmouth, and no doubt at many other places on the north side of the island; this direction is in accordance with the cyclonic theory, but at Christiana, Montego Bay, and Savanna la Mar, the wind was NE.; so that the wind at these places had not yet felt the influence of the cyclonic center. Up to 11 p. m. on the 10th the wind was NE. at Christiana, when the center was 180 miles away, and we do not know when it backed to N.; if this was at 1 a. m., the center would have been 140 miles away.[4]

Now, as the wind had been N. nearly all day at Port Antonio, when the course of the center was much farther away, it is quite clear that the winds at places on the northern shore were far more susceptible to cyclonic influence than at places like Christiana, Montego Bay, and Savanna la Mar, where ranges of hills and forests interfered with the surface current; any local system of storm warning should embody this fact.

With regard to the NE. winds at Kingston and Port Royal at the commencement of the storm, it may be said that the wind at Kingston generally does show some irregularity as a hurricane approaches, due, I believe, to the Port Royal and Blue Mountain ranges, which rise to an average elevation of 5000 feet at a distance of not more than ten miles from Kingston, and protect the city and the harbor from all strong northerly winds.

The next point for consideration is the fact that the wind was much stronger on the north than on the south side of the island at the same distance from the center and within the storm area. It has been already noticed that the open sea allowed light winds to be readily affected by the cyclone at a great distance, but we are now considering the strength of the wind when near its full force.

Thus, at 6 a. m., there should have been a SSW. wind at Port Royal fully equal to any experienced on the north side of the island, which was not the case; and again at Savanna la Mar the wind never rose above 35 miles an hour. How is this to be accounted for?

The cyclonic theory no doubt presents many difficulties. Take, for instance, the motion of the calm area at the center; this is not produced by combining the motions of translation and rotation, for in that case the lowest pressure would not coincide with the calm area, which it invariably does. In the chart of this hurricane we could easily find a line south of the central line, where the wind was blowing from WNW. at twenty miles an hour; combining this with the velocity of the center toward the WNW. of twenty miles an hour, there would be a belt of calm far removed to the south from the belt of lowest pressure; but this was not the case.

Let C be the center of a cyclone, and let A and B be the positions of portions of the moving air in front and in rear of C, respectively:

$$A, \quad C, \quad B;$$

then we are to suppose that C was once at B, and that it will shortly be at A, and that the area of lowest pressure has proceeded from B to A with a wave-like motion, without thrusting the air in front of it or dragging it behind.

Dr. W. N. Shaw, Secretary of the Meteorological Committee of the Royal Society, has shown that if each portion of air within a cyclone simply moves at any instant in accordance with its position and distance from the center at that instant, then the effect of the motion of the center is to make the air (in such a cyclone as we are now considering) sweep in from the north to the central line and then turn sharply around the center, W., S., and SE., while the air south of the central line hardly approaches or even moves away from the center.

Consequently the mountain ranges referred to above and the ranges all along the middle of the island may have great effect in diminishing the strength of W., S., and SW. winds at places south of the central line, especially when the motion of the center is large.

[4] Corresponding to a fall below mean pressure of 0.17 inch.

JAPANESE METEOROLOGICAL SERVICE IN KOREA AND MANCHURIA.

By Prof. Y. WADA. Dated Chemulpo, Korea, August, 1905.

[Translated from the French manuscript, with notes by Dr. S. Tetsu Tamura.[1]]

Since the beginning of the recent Russo-Japanese war, our government, feeling the necessity of a special meteorological service along the coasts of Korea, established at first five meteorological stations, and has since then increased these to the number of nine stations, the approximate geographical coordinates of which are as follows:[2]

TABLE 1.—*Stations with approximate geographic coordinates.*

Localities.	Latitude N.	Longitude E.	Height.
	° ′	° ′	*Meters.*
1. Fusan	35 6	129 3	23
2. Mokpo	34 41	126 4	8
3. Chemulpo...	37 29	126 37	70
4. Wonson	39 9	127 26	3
5. Yongampo ..	39 56	124 22	5
6. Tairen	38 55	121 34	5
7. Yinkow	40 40	122 14	3
8. Mukden	41 48	123 23	57
9. Josin	40 40	129 20	4

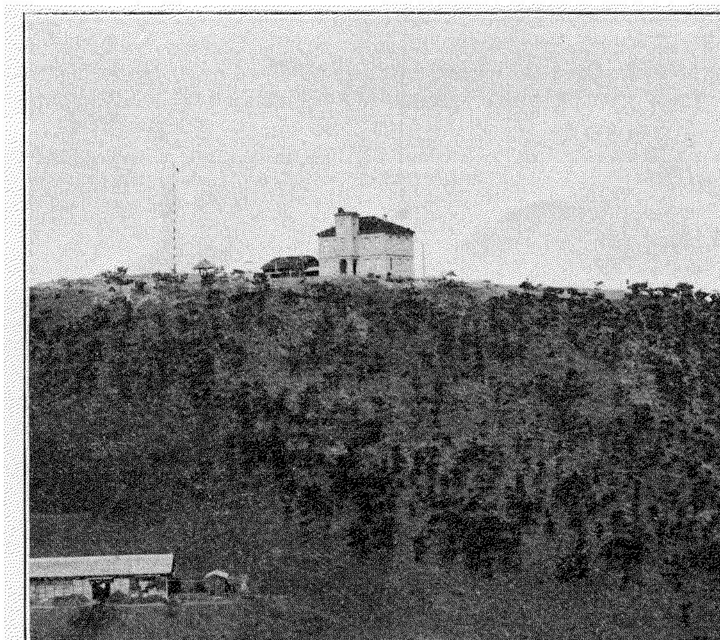

FIG. 1.—The Chemulpo Meteorological Observatory.

Besides the stations above mentioned, there are four others which are at the same time marine semaphore stations.

The Chemulpo Meteorological Observatory is of the first order, and the other eight stations are of the second order

[1] Ever since 1879 Professor Doctor Wada has been connected with the meteorological service in Japan, and has been for many years the chief of the service of predictions in the Central Meteorological Observatory. Japan owes a great deal to him for his important investigations of meteorological conditions in Japan and for the organization and completion of our weather service. At the beginning of the recent Russo-Japanese war Professor Wada was entrusted by the Japanese Government with the organization of a similar system in Korea and Manchuria, and is now completing the work as the chief of that service.—*S. T. T.* [We are pleased to be able to add his photograph to this note.—ED.]

[2] Three new stations, at Port Arthur, Nikoloisk, and Alexandrosk, were added at the moment of sending this note.

TABLE 2.—*The results of observations of the meteorological elements since the founding of the Chemulpo Observatory.*

Month and year.	Atmospheric pressure.*	Air temperature in shade.				Relative humidity.	Vapor tension.	Cloudiness.	Quantity of water.		Wind.		Number of days.												
		Mean.	Absolute max.	Absolute min.	Mean range				Precipitation.	Evaporation.	Mean direction.	Velocity.	◍ ✳ △ ▲	▲ △	⌈↘	≡	⊔	⊔ш	⦶	Clear.	Cloudy	Min. <0°	Mean <0°	Max. <0°	Max. >30°
	mm.	° *C.*	° *C.*	° *C.*	° *C.*	*%*	*mm.*	*0–10*	*mm.*	*mm.*		*m.s.*													
May, 1904	759.4	14.2	23.8	8.8	6.9	81	10.4	5.0	50.5	....	s.41° w.	3	14	1	2	3	0	2	0	9	6	0	0	0	0
June, 1904	756.4	19.7	30.3	12.6	7.6	80	13.5	5.8	34.6	124.3	s.48° w.	4	7	0	3	5	0	6	0	6	12	0	0	0	1
July, 1904	755.7	23.5	32.8	17.0	6.3	83	17.9	7.5	293.7	100.7	s. 5° e.	3	21	0	0	2	0	1	0	4	18	0	0	0	6
August, 1904	756.5	25.5	33.3	17.5	7.5	82	19.8	3.9	117.4	134.0	s.20° w.	3	9	0	0	0	0	5	0	11	6	0	0	0	18
September, 1904	760.3	20.8	30.1	11.1	8.7	72	13.3	4.2	17.1	120.6	n.25°w.	3	5	0	0	1	0	0	0	11	5	0	0	0	1
October, 1904	765.2	13.7	27.5	1.3	9.0	72	8.6	4.2	25.6	91.5	n. 18° e.	3	8	0	1	0	0	2	0	10	6	0	0	0	0
November, 1904	766.4	5.9	16.6	— 4.1	8.0	68	5.1	3.2	16.9	70.9	s.50° w.	3	6	1	1	1	4	4	0	13	3	9	2	0	0
December, 1904	768.7	0.4	13.3	— 9.6	6.8	65	3.3	3.7	11.5	71.5	s.44° w.	3	5	4	0	1	15	1	0	12	2	23	18	6	0
January, 1905	765.5	0.9	8.5	—11.4	6.0	76	3.8	4.3	13.1	59.0	n. 1° e.	4	6	2	0	4	19	6	0	10	7	19	7	5	0
February, 1905	767.4	— 3.1	4.6	—13.1	6.6	63	2.3	3.6	2.4	65.7	n. 4° e.	6	4	0	0	0	13	11	0	9	4	28	25	10	0
March, 1905	767.8	4.0	15.6	— 4.7	8.1	57	3.7	5.0	2.5	127.4	n. 22° e.	6	4	0	0	2	5	14	0	6	7	15	9	0	0
April, 1905	762.5	8.6	22.3	0.3	8.9	66	5.5	5.7	24.5	155.1	n 66°w.	7	8	0	0	3	0	11	0	7	11	0	0	0	0
May, 1905	758.9	13.8	28.3	6.6	7.8	76	8.9	6.2	148.3	134.1	s.55° w.	6	9	0	1	9	0	13	0	7	16	0	0	0	0
June, 1905	755.3	19.4	27.9	12.6	7.3	79	13.0	6.5	60.0	175.6	s.64° w.	5	11	0	0	6	0	5	0	3	12	0	0	0	0
July, 1905	754.7	23.4	32.6	16.7	5.2	87	18.6	8.1	257.8	131.0	s.25° w.	5	17	0	2	12	0	5	2	0	19	0	0	0	1

* The barometric pressures have been reduced to sea level and standard gravity. The correction for gravity is +0.52 mm.

and subordinate to the former. These stations make six observations daily, at 2, 6, 10 a. m., and 2, 6, 10 p. m. on one hundred and thirty-fifth meridian time (east of Greenwich). Each station is provided with a Fortin barometer, an August psychrometer, a maximum thermometer, a minimum thermometer, a Robinson anemometer with electric device, a vane, a pluviometer of two decimeters (eight inches) diameter, an atmometer of the same diameter, a Jordan heliograph or sunshine recorder, a Richard barograph, a Richard thermograph, and a Richard hygrograph. The central Chemulpo Observatory possesses in addition, an anemograph, an anemo-cinemograph, a pluviograph, a micro-seismograph, earth thermometers for different depths and a sufficient number of accessories and apparatus, such as marine chronometers, a theodolite, a sextant, photographic apparatus, etc.

FIG. 2.—Professor Doctor Wada.

The Chemulpo Meteorological Observatory and the whole meteorological service in Korea are under the direct supervision of the present writer as the chief of the service; we receive every day telegraphic reports of three meteorological observations at 6 a. m., 2 p. m., and 10 p. m. from the principal stations in Japan and from those in Korea and Manchuria, with the addition of telegrams twice a day from Tientsin, Chefoo, Zikawei, Nankin, Hangchow, Hankow, Shanshi, Amoy, and Manila. Thus it will be seen that the reports abundantly suffice to enable this observatory to give weather predictions and storm warnings to semaphore stations, as well as to the centers of military and naval operations.

The building for the observatory, constructed temporarily and opened since the beginning of this year, 1905, is situated on a little hill quite near the Japanese concession at Chemulpo, at the mouth of the Kanko River.

The results of the observations of the principal meteorological elements since the founding of this observatory are given in Table 2.

Table 3 gives the results of observations made at the Korean custom-house in Chemulpo, during the years from 1887 to 1903, as compiled at the new Japanese meteorological observatory at Chemulpo.

All the meteorological stations on Korean and Manchurian coasts issue the weather predictions at 4 p. m. every day, and hoist the proper flags on the signal staff. The signals now employed are as follows:

A. Wind signals.

a. Triangular white flag for northerly winds.
b. Triangular green flag for easterly winds.
c. Triangular red flag for southerly winds.
d. Triangular blue flag for westerly winds.
e. Coronet, partly red and partly white, for gales.

B. Weather signals.

a. Rectangular white flag for fair weather.
b. Rectangular red flag for cloudy weather.
c. Rectangular blue flag for rainy weather.
d. Rectangular green flag for snowy weather.

C. Temperature signals.

a. Red pennon for warmer weather.
b. White pennon for colder weather.

The observatory issues storm warnings when an atmospheric disturbance is expected on or near the coasts of Korea and

TABLE 3.—*Result of observations made at the Korean custom-house in Chemulpo, during the years 1887 to 1903, inclusive.*

Month.	Air temperature in degrees centigrade.							Number of days with—						Amount of rain or snow.
	Mean.	Absolute maximum.	Date.		Absolute minimum.	Date.		Maximum temperature. > 30° C.	Maximum temperature. < 0° C.	Minimum temperature. < −10° C.	Fair weather.	Cloudy weather.	Rain or snow	
			Day.	Year.		Day.	Year.							*mm.*
January	− 2.7	13.3	19	1903	−18.0	19	1897	....	24	20	27	4	10	27.1
February	− 1.2	17.8	15	1895	−18.5	2,3	1895	....	12	11	26	2	7	22.0
March	4.0	19.4	30	1898	−10.0	2	1898	....	3	1	26	5	8	28.7
April	10.2	27.2	24	1901	− 7.0	11	1900	....	....	....	25	5	6	63.7
May	15.6	31.1	19	1896	4.0	4	1893	1	....	....	26	5	7	77.9
June	20.1	33.3	30	1894	9.0	12	1902	3	....	....	24	6	8	117.4
July	24.1	35.7	?	1887	11.6	?	1891	20	....	....	22	9	12	183.8
August	25.3	36.7	1,5	1894	15.0	25	1902	26	....	....	24	7	13	175.9
September	21.2	32.8	4	1901	7.3	?	1888	4	....	....	25	5	8	103.5
October	15.1	29.9	?	1890	− 1.7	?	1889	....	....	....	30	1	4	35.5
November	7.7	21.1	2	1902	−10.3	27	1891	....	3	....	28	2	6	38.3
December	0.0	15.0	26	1900	−17.0	29	1901	....	15	8	27	4	11	35.0
Year	11.6	....	....	....	....	....	....	54	57	40	310	55	100	911.8

Manchuria. On receiving them, all the stations immediately display the warning by proper signals on the mast which is painted red and white alternately. Fuller information is obtainable at the signal stations.

The cautionary signals now employed are as follows:

A. Day signals.

a. Red ball indicates that the coast is warned of the approach of threatening weather.

b. Red cylinder indicates the expectation of stormy weather.

c. Red cone announces the approach of cyclonic storm of great intensity.

d. White double cone is hoisted when severe storm is expected in some other districts.

B. Night signals.

a. Red light is employed for a ball.

b. Green light for a cylinder.

c. Green light above a red one for a cone.

d. White light for a double cone.

NOTES AND EXTRACTS.

DR. JULIAN APARICIO.

The death of Dr. Julian Aparicio, who for the past ten years has rendered very important services to science as Director of the National Observatory, San Salvador, Central America, is announced by his successor, Dr. Santiago I. Barberena.

The annals of this observatory have been published rather irregularly. The volume for 1895 appeared in 1901, containing 53 folio pages and giving the observations in extenso. The late director, Julian Aparicio, C. E., was the successor of Dr. A. Sanchez, who seems to have begun in 1891 the regular daily publication of observations in extenso followed by an annual summary, so that the volume for 1894 included 62 pages. A summary of the observations for 1892 is given in the Meteorologische Zeitschrift for 1895, page 228. These publications seem not to be very widely disseminated and a general review of the climatology of San Salvador would be a very welcome contribution to the MONTHLY WEATHER REVIEW.

PIETRO TACCHINI.

Prof. Pietro Tacchini, Chevalier of the Civil Order of Savoy, was born March 21, 1838, at Modena and died March 24, 1905, at Spilamberto, near Modena. After a broad activity in astrophysics at the observatories of Padua, Modena, and Palermo, he was in 1878 appointed successor to Secchi as director of the Astronomical Observatory at the Collegio Romano [distinct from the Vatican Observatory] and in 1879 director of the general Italian service for meteorology, astronomy, and geodynamics. A large number of special memoirs have been published by him in addition to the important work that he did in organizing and carrying on every branch of work relating to terrestrial physics, i. e., meteorology, magnetics, seismology, vulcanology, oceanology. His personal interest was, perhaps, most especially occupied with solar physics and seismology. In 1870 Tacchini and Secchi united in founding the Society of Italian Spectroscopists.

In 1882 he succeeded Cantoni as a member of the International Meteorological Committee, and remained prominently associated therewith until the termination of his official meteorological career in 1900, when he retired from public office and devoted his time to solar observations.

Tacchini was the first organizer and director of the Ufficio Centrale di Meteorologia, to which geodynamics was subsequently added, and that institution was largely built up through his efforts. It will also be remembered that the founding of the astrophysical observatories of Catania and Etna was due to his initiative. In 1871 he first pointed out to the Italian Government the desirability of establishing an astrophysical and meteorological observatory on Etna, and the necessary authority was finally obtained in 1878. Instead of one observatory, Tacchini established two; one near the summit of Etna and the other in the city of Catania, at the foot of the mountain.

For 33 years Tacchini was the director of the Società degli Spettroscopisti Italiani, and the editor of its memoirs. In 1895 he founded the Società Sismologica Italiana.

Although not personally acquainted with Tacchini yet the Editor is able to quote the general testimony of many others as to his remarkably affable character and fairmindedness toward all with whom he came in contact. His enthusiasm was contagious and he inspired all with the desire to do their best in their chosen fields of work. His devotion to pure science influenced the Italian Government to slightly abate its hostility to the Collegio Romano.